

Medication Safety

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“The Canadian Adverse Events Study” was published in the *Canadian Medical Association Journal* on May 25, 2004. ⁽¹⁾ This landmark patient safety study, conducted by lead investigators Dr. Ross Baker and Dr. Peter Norton, provides the first national estimate of the incidence of adverse events among hospitalized patients in Canada. The overall adverse events rate was 7.5 per 100 hospital admissions. The investigators estimated that close to 37 % of adverse events in the study were potentially preventable. Of 360 procedures to which adverse events were attributed, 85 (23.6%) were drug or fluid related.

The fact that drug or fluid-related events were the second leading cause of adverse events strengthens the leadership role of the hospital pharmacist in enhancing the safety of patient care. Hospital pharmacists, in collaboration with health care providers and organizations’ leaders, have already undertaken initiatives to address the prevention and review of medication-related adverse events. The Canadian Society of Hospital Pharmacists’ background paper, “Impact of Hospital Pharmacists on Patient Safety”, highlights examples of progressive services and programs already implemented in Canadian hospitals to improve medication use systems. ⁽²⁾

Medication Incident Reporting System

- **All respondents** (100%) reported use of a medication incident reporting system within their facilities, compared to 93% in 2001/02 (Table G-1). The widespread implementation of reporting systems will facilitate future voluntary reporting to the national database - The Canadian Medication Incident Reporting and Prevention System (CMIRPS) - currently being developed through a collaborative partnership between the Institute for Safe Medication Practices-Canada (ISMP Canada), the Canadian Institute for Health Information, and Health Canada. In the Business plan, it was proposed that CMIRPS provide a secure database to collect reported incident data submitted by healthcare professionals, institutions and patients. Services provided by CMIRPS may include reports addressing national issues, information bulletins, education programs, risk assessment and recommendations to prevent medication incidents.
- Two thirds of all respondents (67%) indicated strategies have been implemented to increase reporting of medication incidents, showing no change since 2001/02. Among these respondents, reported strategies included inservices to promote reporting (74%, 71/96), communication of improvements resulting from reporting (57%, 55/96) incentives to staff for reporting (33%, 32/96), medication incidents reports made non-discoverable (27%, 26/96) and modification of appraisal instruments (11%, 11/96). It is also worth noting that 18% of all respondents reported that medication incident reports had been made non-discoverable, compared to 7% in 2001/02. This positive change to confidential reporting of incidents may partly explain the increase in the number of respondents reporting that medication incidents are reported during each stage of the medication-use process.
- A number of institutions noted that they have implemented the ISMP on-line reporting program specifically designed for hospitals, Analyze-ERR. Analyze-ERR is an internet-accessible, anonymous, error reporting software. The program has two components: 1) reporting of medication incidents to gather uniform and comparable data and 2) analysis of the incidents to generate meaningful information and root causes.

On-line reporting is one example of a strategy facilitating reporting of medication incidents by front line professionals. Another example is a "Nonpunitive Voice-Mail-Based Medication Incident Reporting System."⁽³⁾ This technology allows clinicians to call to report incidents or potential incidents, therefore eliminating paperwork. A Medication Safety Coordinator screens the voice mails and enters pertinent information into the database of the reporting program. This system has been reported to result in a significant increase in reporting at Summa Health System in Akron, Ohio and several process improvements had been implemented following the analysis of those reports.

- Indicators such as the number of near misses reported, the total number of medication incidents reported or the number of medication incidents reported by the health care provider involved in the medication incident, can reflect a culture of safety. Twenty-eight percent of respondents (including those who answered "yes" or "partial") indicated that incidents occurring during prescribing and detected in pharmacy are reported, up from 21% in 2001/02. The percentage of respondents indicating that incidents occurring in pharmacy and detected during final check are reported increased by 7% (34% of respondents in 2003/04 vs. 27% in 2001/02). Results indicate that reporting of this type of "near-miss" is more common in teaching institutions when compared to non-teaching hospitals (45% versus 27%, including those who answered "yes" or "partial").
- The percentage of respondents reporting that incidents detected on the patient care units before administration to the patient are reported most of the time ($\geq 90\%$) increased by 16% - from 50% in 2001/02 to 66% in 2003/04.

The analysis from USP's MEDMARX database of medication errors for 2002 (192,477 records) reports that 34,650 errors originated in the prescribing mode, of which 82% were intercepted before reaching the patient.⁽⁴⁾ Almost half of the dispensing errors (16,853/35,016) were intercepted in the pharmacy. As you get closer to the patient, less than 10% of errors (7.13%, 3,820/ 53,612) are detected before the administration to the patient. These data clearly demonstrate the importance of reporting medication incidents detected in pharmacy or prior to administration to the patient. Reporting of "near-misses" is critical to capture valuable information to guide and prioritize improvements of the medication-use system designed to prevent medication incidents.

- Sixty-three percent of all respondents reported having a policy on the disclosure of incidents to patients and/or their families. Of the 91 respondents with a disclosure policy, 81% reported that disclosure of incidents was documented in the health record. The adoption of a disclosure policy was more commonly reported by teaching hospital respondents (75%) than by non-teaching hospital respondents (56%). The reporting of a disclosure policy was highest in Quebec (73%, 35/48) followed by Ontario (69%, 31/45) and the Prairies (62%, 13/21) and lowest in British Columbia (17%, 2/12).

Table G-1. Reporting Systems for Medication Incidents 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
A medication incident reporting system is in use	144 100%	38 100%	68 100%	38 100%	56 100%	88 100%
Strategies have been implemented, with the goal of increasing the reporting of incidents	96 67%	18 47%	51 75%	27 71%	40 71%	56 64%
Incidents that occur during prescribing and are detected in the pharmacy before dispensing are reported						
Yes (≥90%)	11 8%	4 11%	4 6%	3 8%	5 9%	6 7%
Partial (<90%)	29 20%	9 24%	10 15%	10 26%	15 27%	14 16%
Incidents that occur in pharmacy and are detected during the final check prior to the medication leaving pharmacy are reported						
Yes (≥90%)	19 13%	2 5%	11 16%	6 16%	11 20%	8 9%
Partial (<90%)	30 21%	9 24%	10 15%	11 29%	14 25%	16 18%
Incidents that occur before medication is administered to patient and are detected in patient care area are reported						
Yes (≥90%)	95 66%	20 53%	49 72%	26 68%	36 64%	59 67%
Partial (<90%)	45 31%	16 42%	17 25%	12 32%	20 36%	25 28%
Hospital has a policy on disclosure of incidents to patients and/or their families	91 63%	20 53%	44 65%	27 71%	42 75%	49 56%
Disclosure is documented in the health record (n=91)	74 81%	18 90%	34 77%	22 81%	36 86%	38 78%

Medication Incident Review

- Eighty percent of respondents reported having a designated committee responsible for medication incident review (Table G-2) showing a 10% increase from 2001/02. Ontario led with 93% (42/45), followed by the Prairies (81%, 17/21), Quebec (73%, 35/48), Atlantic (72%, 13/18) and British Columbia (67%, 8/12). Teaching hospitals (91%) and hospitals with greater than 500 beds (87%) were more likely to report a designated committee.
- Among those respondents who reported that a designated committee was responsible for medication incident review, the committees named as responsible for this function included Pharmacy and Therapeutics (60%, 69/115), Risk Management (44%, 51/115), Pharmacy & Nursing (30%, 34/115), General Quality (26%, 30/115), Medical Advisory (20%, 23/115) Medication Quality (17%, 19/115) and other committees (22%, 25/115). Hospitals are encouraged to favor interdisciplinary membership with expertise in medication safety, as the medication-use process involves all professional disciplines.
- A Medication Safety Self Assessment tool was reported to have been completed by half of the respondents (51%). Sixty-one percent of teaching hospitals compared to 45% of non-teaching hospitals reported completing a self-assessment tool. The completion of the self-assessment tool was highest in Ontario (82%, 37/45) and British Columbia (75%, 9/12) and lowest in Quebec (19%, 9/48).

- Of the respondents who reported completing a self-assessment, 95% used the ISMP Hospital Medication Safety Self-Assessment™ tool (ISMP SAT). The ISMP SAT is a comprehensive tool that can help hospitals evaluate the strengths and weaknesses of their medication use processes and identify opportunities for improvement. Most importantly, this tool facilitates the development of a plan to improve medication safety within your institution. This proactive approach permits the identification of actions required to ensure the safety of medication practices. The Canadian Council on Health Services Accreditation will recognize the value of completion of the ISMP SAT in their 2005 standards.
- The percentage of respondents who reported that medication incidents reports can be used during an individual healthcare provider's performance assessment was 21%, an 11% decrease from 2001/02. Teaching hospital respondents (14%) were less likely than non-teaching hospital respondents (25%) to report the use of medication incident reports during individual performance assessments. This positive change is in keeping with the just culture and non-punitive approach strongly encouraged by professional associations.

Table G-2. Medication Safety Review and Assessment 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Designated committee responsible for medication incident review	115 80%	29 76%	53 78%	33 87%	51 91%	64 73%
Information regarding the institution's medication incidents is broadly communicated to general staff/ healthcare providers	58 40%	16 42%	22 32%	20 53%	27 48%	31 35%
Information regarding published medication incidents is broadly communicated to general staff/ healthcare providers	67 47%	17 45%	33 49%	17 45%	28 50%	39 44%
A medication safety self assessment has been completed	74 51%	18 47%	33 49%	23 61%	34 61%	40 45%
Type of medication safety self assessment (n= 74)						
ISMP	70 95%	18 100%	32 97%	20 87%	31 91%	39 98%
Other	4 5%	0 -	1 3%	3 13%	3 9%	1 3%
Medication incident reports can be used during an individual healthcare providers' performance assessment	30 21%	11 29%	12 18%	7 18%	8 14%	22 25%

Medication Incident Reduction Strategies

Since January 1, 2003, health care organizations in the United States have been required to comply with National Patient Safety Goals (NPSGs) to obtain or maintain accreditation. The United States Joint Commission on Accreditation of Healthcare Organizations (JCAHO) issued seven NPSGs for 2004. An expert panel of 23 professionals have identified goals and recommendations based on expert opinion or evidence for each action to improve patient safety. (5) In the near future, Canadian hospitals can expect similar patient safety goals will be adopted by the Canadian Council on Health Services Accreditation. The Canadian Society of Hospital Pharmacists and the American Society of Health System Pharmacists have published guidelines on preventing medication errors in hospitals. (6) (7)

Tables G-3 and G-4 outline strategies to prevent medication incidents. The acronym *NPSG(#)* identifies medication safety initiatives associated with a NPSG.

- Nearly half of all respondents (49%) reported that they do not have a policy requiring checking of two patient identifiers before the medication is administered. This percentage was consistent across all regions, hospital categories and sizes. According to the 2002 MEDMARX data, almost 5% of all errors (8,196/174,930) are due to wrong patient identification, of which 1.4% (112/8,196) resulted in patient harm ⁽⁴⁾.
- Notable improvement has been reported in the area of allergy alerts, with 72% of respondents reporting that patient allergy status is known in $\geq 90\%$ of cases prior to a medication order being dispensed, up from 59% in 2001/02. This percentage is lower in teaching institutions (61%) and hospitals with more than 500 beds (55%).

Communication was the cited cause of errors resulting in patient harm in 17.7 % of reports submitted to MEDMARX in 2002. More specifically, oral orders were the cause identified in 2.6% of reports ⁽⁴⁾.

- Only 76% of respondents (including “yes” and “partial” responses) reported that verbal and telephone orders are limited to situations in which the patient is at risk for harm and the physician is unable to physically write the order. This practice was reported by 64% of respondents in 2001/02. To improve communication among caregivers and enhance patient safety, hospitals should clearly state procedures to be followed in situations when verbal or telephone orders are taken.
- Fifty-two percent of respondents reported that, most of the time ($\geq 90\%$), medication orders remain conditional until reviewed by a pharmacist. Sixty percent of respondents reported a double check procedure was in place ($\geq 90\%$ of time) to validate medication orders entered into the Pharmacy information system against the paper, fax or electronic physician order. An additional 19% reported that a partial system ($< 90\%$) was in place. Medication order review by a pharmacist prior to the medication being available is a key element of safe medication practices. The evaluation of appropriateness of the order against the current treatment profile of a specific patient is an important step of the medication-use process.
- Establishment of a designated list of dangerous abbreviations **not accepted** in the institution was reported by 40% of respondents, a significant increase from the 23% reported in 2001/02. The use of nonstandard or ambiguous abbreviations has led to medication incidents. Hospitals are encouraged to establish a list of abbreviations that should **never be used** throughout the hospital. JCAHO ⁽⁸⁾ and ISMP ⁽⁹⁾ provide a compilation of abbreviations that have been associated with incidents to assist hospitals in establishing their lists.
- Thirty-eight percent of respondents reported that they have identified a list of high-alert medications. Of the 54 respondents with a list, 73% (39/54) have developed a policy requiring a double-check (documentation and initials) before administration of a high-alert medication. High-alert medications are consistently associated with medication incidents resulting in patient harm. The list of most commonly reported products by level of harm, extracted from the MEDMARX database from 2002 ⁽⁴⁾ and the ISMP list of high-alert medicines ⁽¹⁰⁾ can assist hospitals in establishing their lists of high-alert medications.
- Concentrated electrolytes were reported to have been removed from patient care areas by 72% of all respondents, and by almost all respondents in Ontario (96%, 43/45). This reflects the success of safety initiatives conducted by ISMP Canada with Ontario hospitals. Nearly half of the respondents (47%) reported that they have removed concentrated narcotics from patient care units. This percentage reaches 60% (29/48) in Quebec, where deaths by respiratory arrest lead to a Coroner’s investigation. The Coroner’s report included recommendations to remove concentrated narcotics from patient care units. Clearly, safety initiatives will be influenced both by a hospital’s experience with specific products, as well as by published events.

- Standardization of heparin infusion concentrations was reported by the majority of hospitals with greater than 500 beds (95%) and teaching hospitals (91%). Overall, 81% of all respondents reported that they have standardized and limited the number of available heparin infusion concentrations. Most probably, the commercial availability of ready-to-use formulations has facilitated this change. Standardization of infusion concentrations for insulin was reported by 47% of all respondents. These reported rates of standardization for both heparin and insulin are very similar to those reported in 2001/02. For morphine, 47% of respondents reported standardization of infusion concentrations, which represents an 8% increase from 2001/02. Forty-one percent of all respondents indicated the standardization of hydromorphone infusion concentrations.
- Eighty-five percent of respondents reported a formal process was in place to review and approve pre-printed medication orders and 74% of respondents reported having a process to review and approve infusion charts and guidelines. While 56% of respondents reported a formal process to review and approved physician order sets in 2001/02, this percentage has dropped to 35% in 2003/04. The implementation of computerized physician order entry systems requires validation of computerized order sets by a formal committee within the organization to ensure safe practices.

Table G-3. Medication Safety Strategies - Prescribing, Ordering, Transcribing 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Verbal and telephone orders are limited to situations in which patient is at risk for harm and physician is unable to physically write an order (NPSG2)						
Yes (≥90%)	55 38%	17 45%	25 37%	13 34%	21 38%	34 39%
Partial (<90%)	54 38%	9 24%	27 40%	18 47%	23 41%	31 35%
A medication order remains conditional (i.e. no labels printed or drug dispensed, no update of profile or MARs, or access to automated dispensing units) until reviewed by a pharmacist						
Yes (≥90%)	75 52%	20 53%	40 59%	15 39%	32 57%	43 49%
Partial (<90%)	36 25%	10 26%	16 24%	10 26%	14 25%	22 25%
When medication orders are entered into the Pharmacy information system (PIS) from a paper, fax or electronic copy, there is a double check to verify the accuracy of the computer order entry						
Yes (≥90%)	86 60%	23 61%	44 65%	19 50%	33 59%	53 60%
Partial (<90%)	28 19%	7 18%	10 15%	11 29%	10 18%	18 20%
There is a formal process to review and approve						
Pre-printed physician orders	123 85%	27 71%	61 90%	35 92%	50 89%	73 83%
Physician order sets (i.e. for computer order entry)	51 35%	13 34%	25 37%	13 34%	20 36%	31 35%
Infusion dosage charts and guidelines	107 74%	27 71%	50 74%	30 79%	45 80%	62 70%
There is a designated list of dangerous abbreviations that are not accepted (NPSG2)	58 40%	12 32%	26 38%	20 53%	24 43%	34 39%

Table G-4. Medication Incident Reduction Strategies - Preparing, Dispensing, Administration 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
The patient's allergy status is know prior to a medication order being dispensed						
Yes (≥90%)	104 72%	28 74%	55 81%	21 55%	34 61%	70 80%
Partial (<90%)	39 27%	9 24%	13 19%	17 45%	22 39%	17 19%
The hospital has identified a list of high-alert medications	54 38%	12 32%	26 38%	16 42%	23 41%	31 35%
Policy that orders for high-alert medications are double checked and documented (with initials) before administration						
Yes (≥90%)	16 30%	4 33%	8 31%	4 25%	8 26%	8 35%
Partial (<90%)	23 43%	6 50%	9 35%	8 50%	10 42%	13 43%
The hospital has standardized and limited the number of available infusion concentrations for the following high-alert medications, and these standardized concentrations are used in at least 90% of cases for						
heparin	117 81%	27 71%	54 79%	36 95%	51 91%	66 75%
insulin	67 47%	9 24%	38 56%	20 53%	30 54%	37 42%
morphine	68 47%	21 55%	28 41%	19 50%	30 54%	38 43%
hydromorphone	59 41%	17 45%	25 37%	17 45%	24 43%	35 40%
The hospital has removed the following from patient care areas in at last 90% of cases						
concentrated electrolytes (KCl, hypertonic saline)	103 72%	21 55%	52 76%	30 79%	43 77%	60 68%
concentrated narcotics	68 47%	18 47%	32 47%	18 47%	25 45%	43 49%
Policy requiring that two patient identifiers (neither to be the patient's room number) are checked before administering medications						
Yes (≥90%)	45 31%	9 24%	22 32%	14 37%	18 32%	27 31%
Partial (<90%)	25 17%	7 18%	12 18%	6 16%	9 16%	16 18%

Strategies Related to Adverse Drug Events

An adverse event (AE) was defined as “an unintended injury or complication which results in disability, death or prolonged hospital stay and is caused by health care management” in the Canadian Adverse Events Study. This study judged 36.9% of AEs to be preventable, and 23.6% of the factors contributing to AEs were drug or fluid related.⁽¹⁾ A previous publication by Leape et. al, The Harvard Medical Practice Study, also using a chart review methodology, estimated that 20% of all adverse events were medication related⁽¹¹⁾. In most studies, adverse drug events (ADEs) are among the most common type of AEs and account for 20 to 30% of AEs.

The Canadian Adverse Drug Reaction Monitoring Program defines an adverse drug reaction (ADR) as a “noxious and unintended response to a drug which occurs with use or testing for the diagnosis, treatment or prevention of a disease or the modification of an organic function. This includes any undesirable patient effect suspected to be associated with drug use. ADRs as a result of prescription, non-prescription, biological (including blood products), complementary medicines (including herbals) and radiopharmaceutical drug products are monitored. Drug abuse, drug overdoses, drug interactions and unusual lack of therapeutic efficacy are also considered to be reportable as ADRs.”⁽¹²⁾

The detection and internal and external reporting of ADEs has become increasingly important and relevant to organizations in their efforts to improve patient safety. It is the role of the hospital pharmacist to establish a comprehensive program for monitoring, evaluating, and reporting of ADEs and ADRs, as well as to provide educational feedback to health care professionals.

Definitions of adverse drug events (ADEs) and adverse drug reactions (ADRs) were not provided to the respondents. The survey did not differentiate between ADEs, preventable ADEs, potential ADEs or ADRs. In the interpretation of the results, we have assumed that the strategies used to detect and report ADEs and ADRs did not vary based on the definition.

- Seventy-seven percent of teaching hospitals and 54% of all respondents reported implementation of strategies to monitor the occurrence of adverse drug events. (Table G-5). Strategies used to monitor the occurrence of ADEs included: notification from other health providers (85%), therapeutic drug monitoring (72%), pharmacists on rounds (71%), routine review of laboratory test values (55%), alerting orders or trigger medications (42%), patient counseling (31%), medical record coding system (14%) and ADE hotline (8%).
- Implementation of strategies to improve reporting of ADEs was reported by 38% of respondents. Smaller hospitals with 200 or fewer beds were less likely to report implementation of strategies to improve internal reporting of ADEs. The strategies identified were: inservice meetings to promote voluntary reporting (67%), developing protocol to facilitate reporting (61%), sharing report rates with staff (50%) and providing incentives to staff (41%). Even though it is encouraging to see initiatives put in place to facilitate internal reporting, more than half of all respondents (60%) reported that they had not implemented strategies to improve internal reporting of ADE's.

Organizations need to implement user-friendly, on-line adverse drug event reporting systems to encourage spontaneous reporting by frontline professionals. One method, ADE surveillance, is a sensitive method of ADE detection. This method does not rely on documentation or voluntary reporting; ADEs are recorded at the time they occur. A “Pharmacist surveillance of adverse drug events” study was conducted in a 30-bed hospital ward in Canada⁽¹³⁾. Pharmacist surveillance detected 4.4 ADEs per 100 patient days, of which 50% were preventable. These results are comparable to previous studies using similar methodology. Other methods such as computerized triggers, prospective surveillance systems for high-alert medications or patients with a high risk of ADEs and observation-based studies are important components of a comprehensive ADEs program.

The survey did not include a question on strategies to improve the external reporting of ADRs. With the increasing number of new drugs being approved, the increased use of Special Access Drugs and the withdrawal from the market of recently commercialized drugs, Canadian hospitals are strongly encouraged to report ADRs which are unexpected or serious and reactions to recently marketed drugs to Health Canada.

Table G-5. Medication Safety - Use of Strategies Related to Adverse Drug Events (ADEs) 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Strategies have been implemented, to monitor the occurrence of adverse drug events (ADE's)	78 54%	14 37%	38 56%	26 68%	43 77%	35 40%
Types of strategies implemented (n=78)						
Notification from other health providers	66 85%	11 79%	33 87%	22 85%	39 91%	27 77%
Alerting orders or trigger medications (eg. use of antidotes)	33 42%	7 50%	12 32%	14 54%	19 44%	14 40%
Therapeutic Drug monitoring	56 72%	11 79%	28 74%	17 65%	31 72%	25 71%
Routine review of laboratory test values	43 55%	8 57%	21 55%	14 54%	23 53%	20 57%
Pharmacists on rounds	55 71%	9 64%	26 68%	20 77%	33 77%	22 63%
Medical record coding system	11 14%	1 7%	6 16%	4 15%	8 19%	3 9%
Patient Counseling	24 31%	5 36%	10 26%	9 35%	12 28%	12 34%
ADE hotline	6 8%	0 -	2 5%	4 15%	5 12%	1 3%
Strategies have been implemented, to improve internal reporting of ADE's	54 38%	9 24%	28 41%	17 45%	26 46%	28 32%
Types of strategies implemented (n=54)						
Inservice meetings to promote voluntary reporting	36 67%	8 89%	16 57%	12 71%	20 77%	16 57%
Sharing report rates with staff	27 50%	4 44%	12 43%	11 65%	17 65%	10 36%
Providing incentives to staff	22 41%	4 44%	14 50%	4 24%	12 46%	10 36%
Developing protocol to facilitate reporting	33 61%	7 78%	18 64%	8 47%	16 62%	17 61%

Summary

Since the publication of the US Institute of Medicine report *To Err is Human: Building a Safer Health System*⁽¹⁴⁾ patient safety has been at the forefront of the agenda of health care providers, health care facilities and policy makers. Canada has exerted leadership with the establishment of the Canadian Patient Safety Institute (CPSI). The creation of CPSI was one of the 19 recommendations of The National Steering Committee on Patient Safety (NSCPS) in their report entitled *Building a Safer System: A National Integrated Strategy for Improving Patient Safety in Canadian Health Care*⁽¹⁵⁾

Hospital pharmacists are encouraged to provide leadership in the use of proven interventions and best practices in the medication-use process to ensure patient safety and to stimulate interest in research in the field of Medication Safety.

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